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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/063,844      | 05/17/2002  | Ray Fli Lee          | RD29599             | 7978             |

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GENERAL ELECTRIC COMPANY  
GLOBAL RESEARCH CENTER  
PATENT DOCKET RM. 4A59  
PO BOX 8, BLDG. K-1 ROSS  
NISKAYUNA, NY 12309

EXAMINER

SHRIVASTAV, BRIJ B

ART UNIT

PAPER NUMBER

2859

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/063,844

Applicant(s)

LEE ET AL.

Examiner

Brij B Shrivastav

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richard et al, and further in view of Chesneau et al.

As regards to claims 1 and 12, Richard et al teach magnetic resonance imaging system with a computer (figure 1, columns 5 and 6, lines 50-67 and 1-35). The system has a magnet assembly to generate a polarizing magnetic field (figure 1, numeral 10); a gradient coil assembly to generate gradient waveforms along selected gradient axes (figure 1, numeral 22); and a detector array for applying RF energy to excite nuclear spins of an object to be imaged, and to detect signals generated by the excited nuclei of the object (figure 1, numeral 38); and the signals are processed by the computer to produce MR images of the subject (figure 1, numerals 90, 92, 94, 96, and 98). Further, the detector array has a plurality of conductive array elements parallel to a conductive ground plane (figure 2, numeral 42). Richard et al do not specifically teach a plurality of capacitors, wherein at least one capacitor is shunted from each array element to the ground plane to adjust a corresponding electrical length of each conductive array element so that the corresponding capacitor and the ground plane forms a resonator that resonates at a selected frequency. Chesneau et al teach a plurality of capacitors,

Art Unit: 2859

wherein at least one capacitor is shunted from each array element to the ground plane to adjust a corresponding electrical length of each conductive array element so that the corresponding capacitor and the ground plane forms a resonator that resonates at a selected frequency (figures 2 and 3a-3c, column 6, lines 52-62).

It would have been obvious to one of ordinary skill in the art to combine Chesneau et al's plurality of capacitor(s) shunting conductive array element(s) forming ground plane resonant circuit(s) with the detector array of Richard et al to resonate at a particular frequency to pickup signals at very high signal to noise ratio from the excited nuclei of the object to be imaged, improving image quality.

As regards to claims 2, 3, and 5, Richard et al teach array elements are strips, a capacitor or a plurality of capacitors interconnect between each neighbor array element, and lumped element circuits decouple detector array elements (figures 2, 3, 6 and 8).

As regards to claims 9, 10, 15 and 16, Richard et al further teach detector array as either a transmitter or a receiver detector (figure 1, numerals 38 and 90).

As regards to claims 11 and 17, it is common in the art to use only one detector array element assembly both as a transmitter and as a receiver, reducing operating cost of the MRI system.

As regards to claims 4, 6, 7, 13, and 14, Richard et al do not further teach decoupling interface at the end of each array element comprising lumped matching elements, and to match selected impedance. Chesneau et al teach decoupling interface at the end of each array element comprising lumped matching elements, and to match selected impedance (figures 3 and 4). It would have been obvious to one of ordinary

Art Unit: 2859

skill in the art to adapt Chesneau et al's teaching with the detector array of Richard et al to further improve signal to noise ratio of the detected signal to improve image quality.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brij B Shrivastav whose telephone number is 703-305-0649. The examiner can normally be reached on 7 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. F. Gutierrez can be reached on 703-308-3875. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-304-7722 for After Final communications.


Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0956.

Application/Control Number: 10/063,844  
Art Unit: 2859

Page 5

Bbs

June 24, 2003



Brij B. Shrivastav

Patent Examiner